2008 Compensatory Mitigation Monitoring Report

L.E. CARPENTER & COMPANY

170 North Main Street
Block 301, Lot 1 and Block 801, Lot 3
Borough of Wharton
Morris County, New Jersey

NJDEP File #1439-04-0001.1

Prepared for:

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Prepared by:

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JFNew Project #040229

319474

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INTRODUCTION

L.E. Carpenter & Company (LEC) implemented a Remedial Action Work Plan (RAWP) for the impacted portion of their ± 14.6-acre site (approximately 4.7 acres of disturbed area) located at 170 North Main Street, Borough of Wharton, Morris County, New Jersey (Figure 1). The site comprises Block 301, Lot 1 and Block 703, Lot 30 on the Borough of Wharton tax map. The project area is located in the USGS Dover, New Jersey quadrangle with center state plane coordinates of N 754326.5 E 470891.83 (NAD 1983) (Figure 2). A 2002 aerial photograph of the project site is also included (Figure 3).

Due to the parcel's previous utilization for mining and forging throughout the 1700's and 1800's, and vinyl manufacturing from 1943 to 1987, contaminated soils and groundwater were identified on the site. RMT, Inc. (RMT), on behalf of LEC, worked with the U.S. Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (NJDEP) to implement the RAWP for those impacted areas of the property.

As part of the RAWP, several "Hot Spots" (areas exhibiting either inorganic or organic contaminant concentrations in soil in excess of the 1994 Record of Decision (ROD) cleanup criteria) were identified across the site for removal. Several areas identified for contaminant removal overlapped with jurisdictional wetlands on site. A total of 0.337 acre of jurisdictional wetlands was temporarily impacted as a result of site remediation activities (Figure 4). This acreage consisted of a 0.003 acre and 0.009 acre lobe of forested/scrub-shrub wetland on site, 0.286 acre of forested/scrub-shrub and emergent marsh wetland to the east on the Wharton Enterprise property, and 0.039 acre of the Air Products open-water drainage channel relocation to the northeast. Due to the fact that project activities and wetlands extend off site onto adjacent properties, the project area or site referenced in this plan includes the LEC parcel, several acres of the Wharton Enterprises parcel to the east, and the Air Products drainage channel to the northeast.

Upon completion of cleanup activities, the entire 0.337 acre of wetland disturbance was restored and enhanced as more diverse emergent wetland communities. All temporary wetland impacts were restored and mitigated for at their current locations. A Wetland Mitigation Construction Final Report, dated August 28, 2005, was submitted to the NJDEP upon completion of restoration activities.

The main source of hydrology for the restored wetland is a direct surface water flow from the Rockaway River. The wetland area was restored to pre-cleanup grades. The intention was to restore and enhance the pre-existing wetland so that there is no-net loss of wetlands as a result of the clean-up work completed by LEC.

The primary means through which wetland vegetation will be established in the mitigation area is through planting native seed and bare root stock trees, as well as natural colonization from the adjacent wetland areas. For a list of planted species within the mitigation area and transition zone, see Appendix A.

MONITORING

Annual monitoring of the mitigation area is proposed for five years, unless it is apparent the wetland has been successfully established sooner, upon which case the permittee will propose elimination of any subsequent reports in writing to the NJDEP. Only upon written concurrence from the NJDEP will any reporting requirements be eliminated.

LEC will submit annual reports to the NJDEP by December 31 of each monitoring year in accordance with the requirements outlined in the NJDEP Mitigation Project Monitoring Reports Checklist for Completeness. The monitoring reports will, at a minimum, include the following:

1. Photographs of the wetland mitigation areas.
2. Assessment of vegetative communities and evaluation of whether a dominance of wetland species exists (according to federal wetland indicator status of species identified).
3. Wildlife utilization evaluation.
4. Hydrology evaluation.
5. Soil evaluation.
6. Sediment loading evaluation.
7. Evaluation of sideslope and transition area conditions. Evaluation of overall progress toward successful achievement of wetland creation as designed, per each of the performance standards dictated for the project. Perform a comparative assessment between existing conditions and the performance standards.

This document will serve as the fourth annual monitoring report.

METHODS

A spring site visit was completed on May 29, 2008 followed by a thorough review of the mitigation site on August 28, 2008. During the May visit, conditions were sunny and 70° F while conditions were sunny and 80° F during the August site visit. Two site visits (May 29 and September 4) were also conducted to chemically treat the invasive species of purple loosestrife (*Lythrum salicaria*) and reed canary grass (*Phalaris arundinacea*) in 2008. Two hundred seventy five (275) trees and shrubs were installed by JFNew with predator guards to compensate for a complete mortality of tree and shrub species planted in June of 2005. Five additional monitoring wells were also installed by RMT prior to tree and shrub installation (April 2008) and placed within the wetland mitigation area as required by the regulatory agencies. There was some concern that sections of the wetland mitigation area would be disturbed during the installation, so repair of the disturbed areas following the well installation was completed by JFNew and included the following steps:

a. *Decompaction of soil* – The areas where soil was impacted during well installation were reviewed by JFNew prior to planting. Although some rough grading was smoothed and some additional topsoil was added, no widespread decompaction was deemed necessary prior to seed and tree installation.

b. *Topsoil placement* – In the disturbed areas, topsoil was installed and then incorporated into the existing soil to prepare a planting bed.

c. *Seeding and erosion control fabric placement on well mounds* – A facultative wetland seed mix and a 100% biodegradable straw/coconut fiber erosion control fabric were installed to help stabilize the soil on these mounds.

d. *Seeding of disturbed areas* – Following all soil preparations, native seed was installed in the disturbed areas, according to the original plan specifications. The seed was installed in May 2008.

The wetland was walked using the random meander method. All plant species encountered during the walk-through were recorded on inventory data sheets until no new plant species were observed (Appendix B). Plant names were used as listed in Gleason and Cronquist (1991).

Three permanent transects were set up in order to measure percent cover of vegetation in the wetland (Figure 4). Several 1-m^2 plots were laid along the transect in order to measure the vegetative cover. A percent cover value was assigned to each species found in the plots. Total vegetative cover was calculated by averaging the vegetative cover from each plot along the transect (Appendix B).

Information on hydrology was collected using evidence provided by soil pits. Permanent reference points were located at the beginning of each transect so that water levels are recorded in the same location from year-to-year. The site was also inspected for problems such as erosion, sedimentation, and water quality issues. Signs of wildlife use were recorded during the walk-through. Finally, permanent photopoint locations were identified and reference photographs were taken.

VEGETATIVE COMMUNITY

The data from the plots was used to describe the vegetative cover. Of the total wetland and transition areas, an average of 95% was vegetated and 5% was bare soil. The total vegetative cover in the emergent (89%) and forested (98%) zones has remained high and supports the qualities of well-functioning wetland areas. While the total number of species has decreased in the emergent zone, the actual vegetative cover by native wetland indicator species has increased from 2007 (Table 1). The total number of species and number of native wetland indicator species in the forested zone has increased from the previous year and is currently higher than any previous monitoring year (Table 2). The total number of species within the transition zone has steadily increased each year and has reached its highest diversity to date (Table 3).

Dominant species, based on relative cover (RC), in the emergent zone include redtop (*Agrostis gigantea*) (17.6% RC), grass-leaved goldenrod (*Euthamia graminifolia*) (11.1% RC), tall goldenrod (*Solidago altissima*) (9.6% RC), tickle grass (*Agrostis hyemalis*) (9.2% RC), and purple loosestrife (*Lythrum salicaria*) (4.9% RC). Dominant species in the forested/scrub-shrub

zone include tickle grass (21.9% RC), tall goldenrod (11.0% RC), barnyard grass (*Echinochloa crusgalli*) (10.2% RC), and grass-leaved goldenrod (9.7% RC). Dominant species in the transition zone include grass-leaved goldenrod (19.1% RC), crowfoot grass (*Dactyloctenium aegyptium*) (13.1% RC), red top (11.2% RC), and panic grass (*Panicum dichotomiflorum*) (6.9% RC).

Table 1. A summary of species diversity in the emergent zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover	Percent Actual Vegetative Cover by NWIS
2005	49	19 (39%)	29 (59%)	77%	11%
2006	46	24 (52%)	31 (67%)	90%	38%
2007	56	36 (64%)	44 (79%)	78%	31%
2008	48	24 (50%)	32 (67%)	89%	39%

Table 2. A summary of species diversity in the forested/scrub-shrub zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover	Percent Actual Vegetative Cover by NWIS
2005	51	23 (45%)	34 (67%)	82%	10%
2006	53	29 (55%)	41 (77%)	98%	26%
2007	54	23 (43%)	36 (67%)	82%	41%
2008	70	37 (53%)	48 (69%)	98%	53%

Table 3. A summary of species diversity in the transition zone

Year	Total # Species	# Native Wetland Indicator Species (NWIS)	# Native Species	Percent Vegetative Cover
2005	37	7 (19%)	19 (51%)	62%
2006	49	10 (31%)	28 (57%)	94%
2007	63	19 (30%)	39 (62%)	100%
2008	69	14 (20%)	38 (55%)	97%

The following invasive species were observed within the mitigation wetlands during the 2008 monitoring visit: reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*). These species were located in a strip approximately 10' wide around the north and east border of the emergent zone, and were apparently increasing in cover in 2007. However, in the emergent zone, purple loosestrife decreased from 7.4% RC in 2007, to 4.9% RC in 2008. Also in the emergent zone, reed canary grass decreased from 3.4% RC in 2007 to 2.7% RC in 2008. In the forested zone, purple loosestrife decreased from 5.3% RC in 2006 to 4.2% RC in 2007, and continued to decrease to 2.0% RC in 2008. Reed canary grass remained absent from the transect data in the forested area. These species will continue to be selectively treated using wetland-approved herbicides. Annual treatments will be performed twice each year through September 2009, or until invasive populations have been effectively controlled.

During the 2007 site visit, it was noted that all of the planted (June 28, 2005) bareroot trees and shrubs had died through a combination of drought conditions and deer predation. In May of 2008, 275 supplemental bareroot trees and shrubs were installed (Appendix A) with predator guards, to encourage sufficient coverage to meet mitigation requirements. During the August 28, 2008 site visit, 165 trees and shrubs were sampled to determine survival. Of the 165 sampled trees, a total of 73 live trees were counted (44.2% survival).

MAINTENANCE

Invasive or noxious vegetation can oftentimes prevent or hinder the successful establishment of native species in a wetland mitigation area. For this reason, a routine wetland maintenance program is being implemented at the LEC project site. This program includes semi-annual site visits to assess and treat (if necessary) any invasive species found on the property. Based on knowledge of the site and adjacent communities, chemical applications have been selected as the most effective maintenance tool for control of invasive species. Invasive species on the site were chemically treated on May 29 and September 4, 2008.

Any potential browsing damage by herbivores will be noted and addressed during routine maintenance site visits. Should the need arise, deer or goose fencing will be erected around the seeded areas to promote growth and restrict grazing or browsing. As stated earlier, all tree and shrub plantings in May 2008 were installed with predator guards to reduce possible herbivory.

Subsequent to permit issuance and after the restored wetland areas had been planted, several federal agency personnel raised a concern over the use of barnyard grass (*Echinochloa crusgalli*) in the wetland restoration seed mix. Due to the fact that several respected botanical sources disagree on the status of barnyard grass as a native versus non-native species, it was decided that barnyard grass populations on the project site will be monitored. If at any time it is determined that barnyard grass is having a detrimental effect on the mitigation area or prohibiting the establishment of other native species, it will be effectively controlled during the semi-annual maintenance site inspections. At this time, barnyard grass does not appear to be a long-term concern.

HYDROLOGY AND WATER QUALITY

Site conditions in 2008 were slightly drier than those in 2007. During the August 28 site visit, the hydrology was dry to moist with saturation at the soil surface. The wettest areas occurred in the eastern end of the wetland area. During the May 29 site visit, hydrology was present throughout the emergent and forested zones ranging from saturation at the surface to 3 inches of inundation in the eastern portion of the wetland.

WILDLIFE HABITAT

Evidence of wildlife use was present in the mitigation wetland (Table 4). The presence of white-tailed deer and Canada Goose continue to be evident, though herbivory by these species does not appear to have caused detrimental harm to the herbaceous species. The complete loss of all

planted trees in 2005 may be directly related to the herbivory by white-tailed deer. As the mitigation site progresses and the wetland vegetation becomes dominant, it is expected that the wildlife observations will continue to increase, and the desired goal of creating wildlife habitat within the mitigation area will be achieved.

Table 4. Comprehensive list of wildlife observations in the mitigation wetland

SCIENTIFIC NAME	COMMON NAME
BIRDS	
Cyanocitta cristata	Blue Jay
Buteo jamaicensis	Red-Tailed Hawk
Branta canadensis	Canada Goose*
Zenaida macroura	Mourning Dove*
Colaptes auratus	Northern Flicker
AMPHIBIANS	
Rana clamitans	Green frog*
MAMMALS	
Odocoileus virginianus	White-tailed deer*
INSECTS	
Papilio glaucus	Tiger swallowtail

*Observed in 2008

SOILS

During the 2008 site visit, soil characteristics and textures were not specifically examined due to the fact that this had previously been done in June 2005. Results of the soil profile review were presented in the Wetland Mitigation Construction Final Report, dated August 28, 2005, and are again presented below (Table 5).

Table 5. Soil profile review

	Soil Depth	Munsell Soil Color	Soil Texture
Boring 1 (40.54.15.00748N 74.34.31.41719W)	 0-10” 10-20”	 10YR 4/3 10YR 3/3	 Loam Loam
Boring 2 (40.54.14.42438N 74.34.31.14259W)	 0-13” 13-20”	 10YR 4/2 10YR 3/2	 Loamy clay Loamy clay
Boring 3 (40.54.13.75148N 74.34.31.31904W)	 0-15” 15-20”	 10YR 4/3 10YR 3/1	 Loam Loamy clay
Boring 4 (40.54.13.94790N 74.34.29.98567W)	 0-2” 2-20”	 10YR 4/3 10YR 3/2	 Loam Loam
Boring 5 (40.54.14.63046N 74.34.29.45719W)	 0-9” 9-20”	 10YR 4/3 10YR 3/2	 Loam Loam

	Soil Depth	Munsell Soil Color	Soil Texture
Boring 6 (40.54.12.80847N 74.34.34.70682W)	0-20”	10YR 3/3	Loam

SEDIMENTATION AND EROSION CONTROL

There were no signs of erosion problems on the days the site was investigated. The potential for erosion issues has decreased due to the site’s increased vegetative cover. It is expected that as the vegetative cover of the mitigation area continues to increase, the potential for erosion will be effectively eliminated.

CONCLUSIONS

The mitigation area was constructed during an extremely dry growing season, and late installation of seed and bare root trees, as well as herbivory by white-tailed deer and Canada Goose, were causes for the slow development of the mitigation wetland areas. However, during the May 29, 2008 site visit, 275 bare root trees and shrubs were installed with predator guards to compensate for the complete mortality of the 2005 woody plant installation. The actual percent cover by native wetland species has increased since construction of the site, but still remains lower than the required 85% cover by native wetland species.

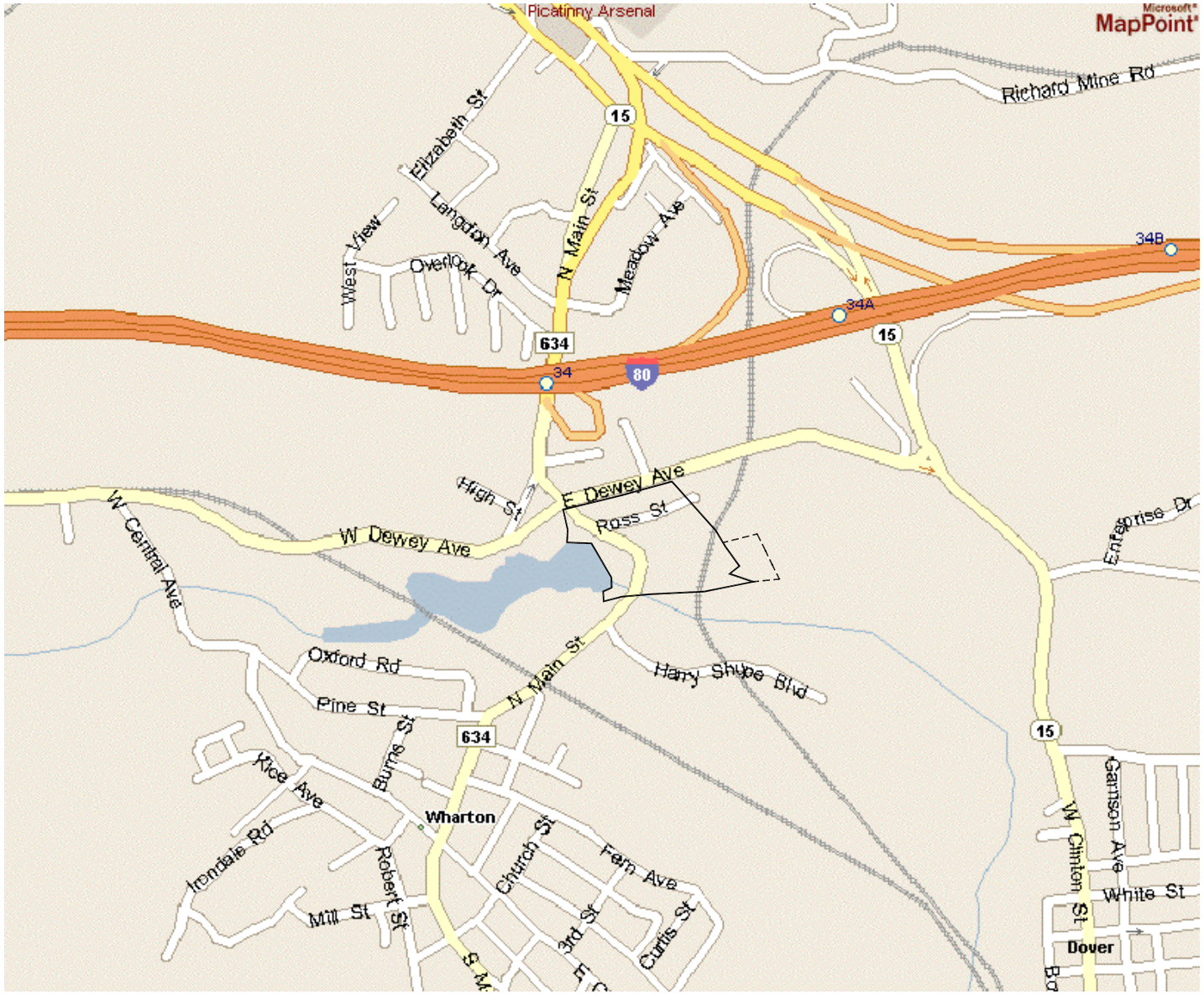
At this time, it is recommended that LEC continue maintenance visits for invasive species control to eliminate or effectively control their presence in the wetland mitigation area. LEC currently has a 5-year maintenance plan contract in place that includes semi-annual visits.

Due to the fact that wetland communities surrounding the mitigation site and elevations were restored to pre-existing contours with no impedance to surface or groundwater flow, we expect that wetland and transition zone restoration will continue to progress and be successful. This was seen in the results of the emergent and forested wetland areas with an increase in total cover by wetland indicator species in both of these areas.

REFERENCES

Gleason, Henry and Arthur Cronquist. 1991. *Manual of Vascular Plants of North-eastern United States and Adjacent Canada*. D. Van Nostrand Company, New York, New York. 910 pp.

Figures



LEGEND

- APPROXIMATE PROPERTY BOUNDARY

- EXPANDED PROJECT AREA

JFNew
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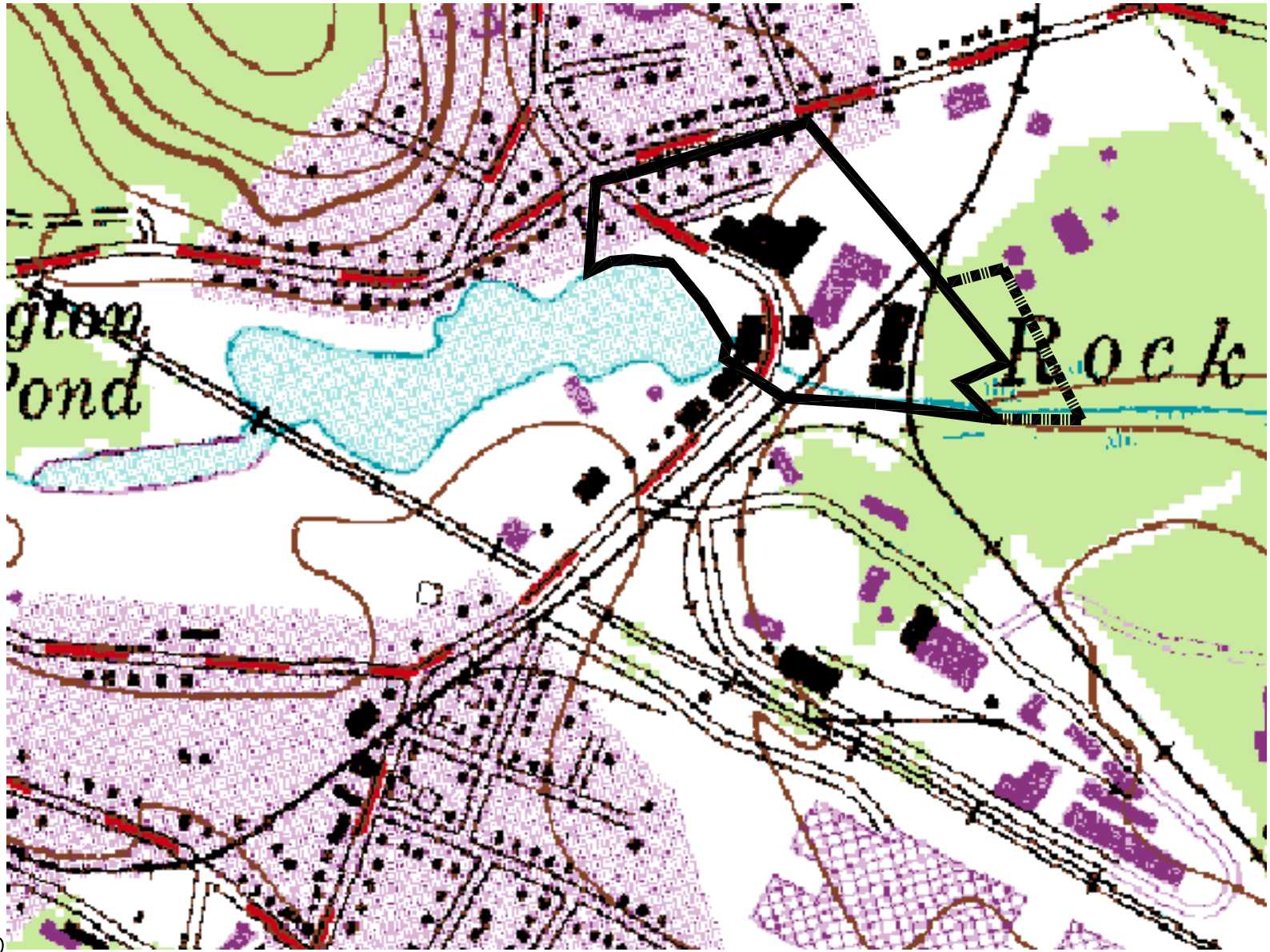
FIGURE 1 - LOCATION MAP

L.E. CARPENTER
WHARTON, NEW JERSEY

N

SCALE: NTS
DATE: 09.23.04
FILE: 040229LocationMap



LEGEND

- APPROXIMATE PROPERTY BOUNDARY

- EXPANDED PROJECT AREA

NOTES

STATE PLANE COORDINATES - 754326.58N 470891.83E (NAD83)

SOURCE:USGS DOVER,NJ QUADRANGLE

HUC-14 CODE 02030103030070

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FIGURE 2 - USGS MAP

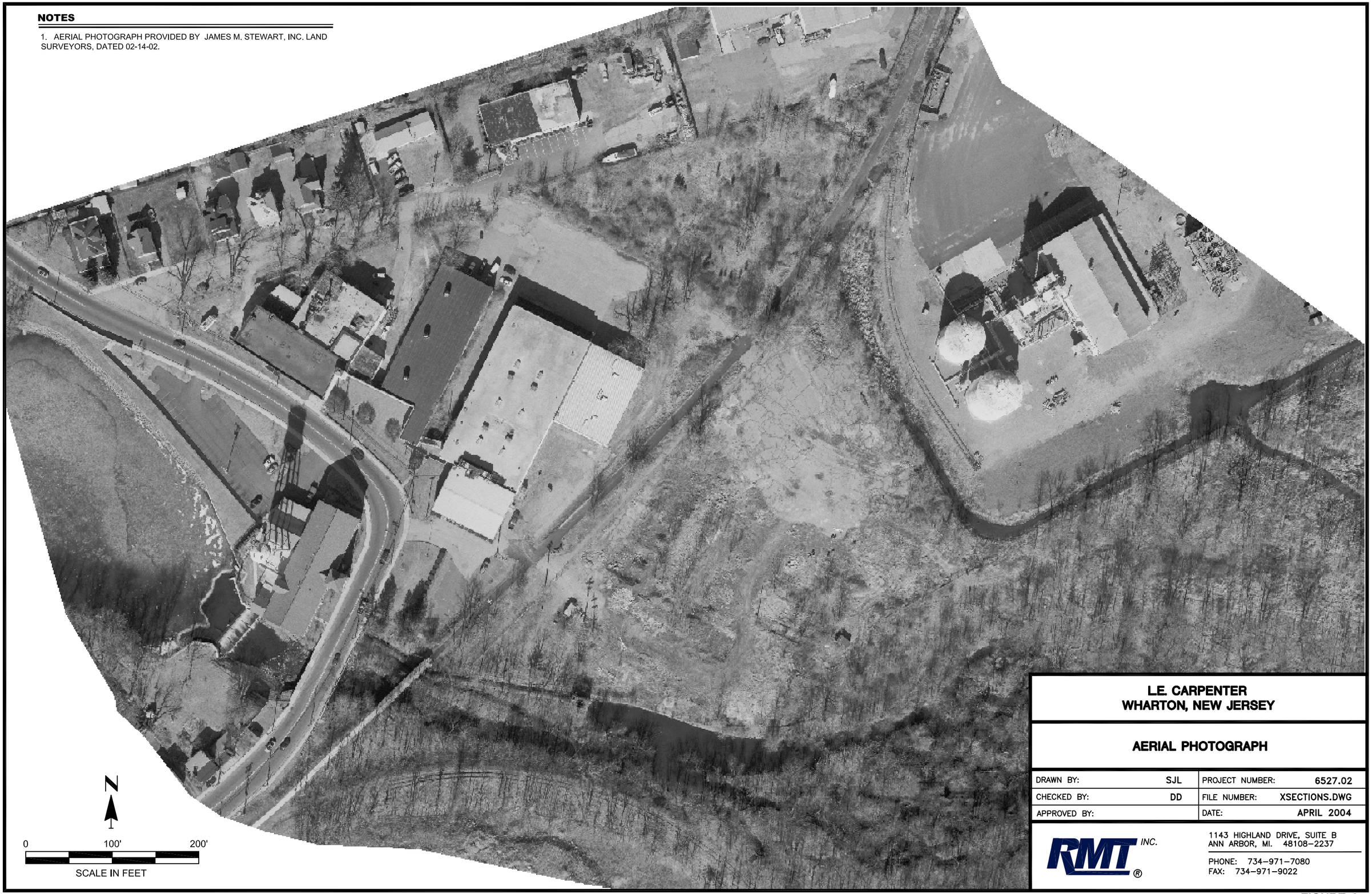
L.E. CARPENTER
WHARTON, NEW JERSEY

N

SCALE: NTS
DATE: 12.12.2005
FILE: 040229USGSmap

NOTES

1. AERIAL PHOTOGRAPH PROVIDED BY JAMES M. STEWART, INC. LAND SURVEYORS, DATED 02-14-02.



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LE. CARPENTER
WHARTON, NEW JERSEY

AERIAL PHOTOGRAPH

DRAWN BY:	SJL	PROJECT NUMBER:	6527.02
CHECKED BY:	DD	FILE NUMBER:	XSECTIONS.DWG
APPROVED BY:		DATE:	APRIL 2004

RMT INC.
1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
PHONE: 734-971-7080
FAX: 734-971-9022

FIGURE 3

EMERGENT WETLAND (PEM) SEED MIX (0.19 acre)

NATIVE COMPONENT

Scientific Name	Common Name	Ounces/Acre
Acorus calamus	Sweet flag	8.50
Alisma subcordatum	Common water plantain	8.00
Echinochloa crusgalli	Barnyard grass	12.00
Eleocharis obtusa	Blunt spike rush	3.00
Iris virginica shrevei	Blue flag iris	4.00
Juncus effusus	Soft rush	3.00
Leersia oryzoides	Rice cut grass	4.00
Lobelia cardinalis	Cardinal flower	0.75
Lobelia siphilitica	Great blue lobelia	1.00
Mimulus ringens	Monkey flower	2.00
Peltandra virginica	Arrow arum	16.00
Polygonum pensylvanicum	Pinkweed	6.00
Pontederia cordata	Pickerelweed	8.00
Sagittaria latifolia	Common arrowhead	8.00
Scirpus validus	Softstem bulrush	6.00
Sparganium eurycarpum	Common burreed	10.00
		TOTAL 100.25 oz/acre = 6.27 lbs/acre

TEMPORARY COVER COMPONENT

Scientific Name	Common Name	Ounces/Acre
Agrostis alba	Redtop	16.00
Lolium multiflorum	Annual rye	400.00
		TOTAL 416.00 oz/acre = 26.00 lbs/acre

SLOPE STABILIZATION SEED MIX (0.21 acre)

NATIVE COMPONENT

Scientific Name	Common Name	Ounces/Acre
Andropogon gerardii	Big bluestem	20.00
Andropogon scoparius	Little bluestem	32.00
Bouteloua curtipendula	Side-oats grama	3.00
Elymus canadensis	Canada wild-rye	5.00
Panicum virgatum	Switch grass	12.00
Sorghastrum nutans	Indian grass	24.00
		TOTAL 96.00 oz/acre = 6.00 lbs/acre

TEMPORARY COVER COMPONENT

Scientific Name	Common Name	Ounces/Acre
Agrostis alba	Redtop	16.00
Elymus hystrix	Eastern bottlebrush grass	64.00
Lolium multiflorum	Annual rye	400.00
		TOTAL 480.00 oz/acre = 30.00 lbs/acre

WOODED WETLAND UNDERSTORY SEED MIX (0.20 acre)

NATIVE COMPONENT

Scientific Name	Common Name	Ounces/Acre
Actinomeris alternifolia	Wingstem	1.00
Alisma subcordatum	Common water plantain	3.00
Aster umbellatus	Flat-top aster	1.25
Bidens cernua	Nodding bur marigold	3.00
Calamagrostis canadensis	Blue joint grass	3.00
Carex crinita	Fringed sedge	2.00
Carex hystericina	Porcupine sedge	4.00
Carex lupulina	Common hop sedge	4.00
Carex vulpinoidea	Fox sedge	6.00
Chelone glabra	Turtlehead	1.25
Elymus canadensis	Canada wild rye	6.00
Elymus virginicus	Virginia wild rye	12.00
Glyceria striata	Fowl manna grass	4.00
Helenium autumnale	Sneezeweed	1.50
Leersia oryzoides	Rice cut grass	2.00
Lobelia silphilitica	Great blue lobelia	1.50
Mimulus ringens	Monkeyflower	1.75
Panicum virgatum	Switch grass	2.50
Rudbeckia laciniata	Wild golden glow	0.75
Scirpus atrovirens	Dark green rush	6.00
Spartina pectinata	Prairie cord grass	4.00
	TOTAL	70.50 oz/acre = 4.41 lbs/acre

TEMPORARY COVER COMPONENT

Scientific Name	Common Name	Ounces/Acre
Agrostis alba	Redtop	16.00
Elymus hystrix	Eastern bottlebrush grass	64.00
Lolium multiflorum	Annual rye	400.00
		TOTAL 480.00 oz/acre = 30.00 lbs/acre

BARE ROOT TREES (PFO/SS WETLAND) (0.20 acre)

Scientific Name	Common Name	Quantity
Acer saccharinum	Silver maple	25
Betula nigra	River birch	25
Fraxinus pennsylvanica	Green Ash	50
Quercus palustris	Pin oak	25
	TOTAL	125

BARE ROOT SHRUBS (CHANNEL SLOPE STABILIZATION) (0.03 acre)

Scientific Name	Common Name	Quantity
Cornus obliqua	Silky Dogwood	50
Salix discolor	Pussy Willow	50
	TOTAL	100

BARE ROOT TREES (TRANSITION ZONE) (0.18 acre)

Scientific Name	Common Name	Quantity
Acer saccharum	Sugar Maple	25
Juglans nigra	Black Walnut	25
Liriodendron tulipfera	American elm	50
Quercus rubra	Northern red oak	50
	TOTAL	150

LEGEND

- APPROXIMATE PROPERTY LINE
- FENCE LINE
- TREES
- 630 FINAL GRADE CONTOUR LINE
- PVC-1 WETLAND RESTORATION AND TRANSITION ZONE BOUNDARY POINTS MARKED IN THE FIELD WITH 3-foot LENGTHS OF 3-inch WHITE PVC; LURP Special Condition 11c
- BORING 1 BORING 1: NJDEP LURP REQUIRED SOIL BORINGS, Permit Condition 11e
- AREA OF SOURCE REDUCTION DISTURBANCE OUTSIDE OF REGULATED WETLAND AREA
- STATE OPEN WATERS
- WETLAND BOUNDARY
- LIMITS SOURCE REDUCTION PCB EXCAVATION WITHIN REGULATED WETLAND AREA
- PEM (EMERGENT WETLAND)
- PFO / SS (FORESTED / SCRUB-SHRUB WETLAND)
- PFO / SS IMPACT (0.23 ACRE)
- PEM IMPACT (0.19 ACRE)
- TRANSITION ZONE IMPACT (0.18 ACRE)

SAMPLE OR MONITORING LOCATION AND NUMBER

- MW-21 MONITORING WELL LOCATION AND NUMBER
- TRANSECT LOCATION WITH PLOTS
- PHOTOSTATION LOCATIONS

WETLAND SIGN LOCATION

- W WETLAND MITIGATION PROJECT SIGN

NOTES

1. BASE MAP DEVELOPED FROM TOPOGRAPHIC SURVEY PROVIDED BY JAMES M. STEWART, INC. LAND SURVEYORS, DRAWING NO 2793-03.DWG, DATED 02-14-02.
2. TOTAL PROPOSED WETLAND IMPACT 0.42 ACRE.
3. PROPOSED DENSITY FOR TREE RESTORATION IS 10' ON CENTER.

N

0 30' 60' 90' 120'
SCALE IN FEET

JFNew
11181 Marwill Avenue, MI 49460
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NO.	BY	DATE	REVISION	APP'D.
5.				
4.				
3.				
2.				
1.				

L.E. CARPENTER
WHARTON, NEW JERSEY

MITIGATION MONITORING MAP

DRAWN BY: SJL	SCALE: SHOWN	PROJECT NO. 6527.16
CHECKED BY: NC		FILE NO. 6527.16.01.DWG
APPROVED BY:	DATE PRINTED:	FIGURE 4
DATE: AUGUST 2005		

RMT INC.
1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
PHONE: 313-971-7080
FAX: 313-971-9022

RMT COMPUTER AIDED DESIGN AND DRAFTING

PLOT DATA
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Appendices

Appendix A:
Planting List

EMERGENT WETLAND IMPACT AREA (0.19 acre)

Emergent Wetland Seed Mix (32.27 pounds/acre)

Native Component

Scientific Name	Common Name	Ounces/Acre
Acorus calamus	Sweet flag	8.50
Alisma subcordatum	Common water plantain	8.00
Echinochloa crusgalli	Barnyard grass	12.00
Eleocharis ovata	Blunt spike rush	3.00
Iris virginica shrevei	Blue flag iris	4.00
Juncus effusus	Soft rush	3.00
Leersia oryzoides	Rice cut grass	4.00
Lobelia cardinalis	Cardinal flower	0.75
Lobelia siphilitica	Great blue lobelia	1.00
Mimulus ringens	Monkey flower	2.00
Peltandra virginica	Arrow arum	16.00
Polygonum pensylvanicum	Pinkweed	6.00
Pontederia cordata	Pickerelweed	8.00
Sagittaria latifolia	Common arrowhead	8.00
Scirpus validus	Softstem bulrush	6.00
Sparganium eurycarpum	Common burreed	10.00
TOTAL NATIVE FORBS AND GRASSES		100.25 = (6.27 lbs/acre)

Temporary Cover Component

Scientific Name	Common Name	Ounces/Acre
Agrostis gigantea	Redtop	16.00
Lolium perenne	Annual rye	400.00
TOTAL		416.00 = (26.00 lbs/acre)

FORESTED/SCRUB-SHRUB IMPACT AREA (0.20 acre)

Wooded Wetland Understory Seed Mix (34.41 pounds/acre)

Native Component

Scientific Name	Common Name	Ounces/Acre
Alisma subcordatum	Common water plantain	3.00
Aster umbellatus	Flat-top aster	1.25
Bidens cernua	Nodding bur marigold	3.00
Calamagrostis canadensis	Blue joint grass	3.00
Carex crinita	Fringed sedge	2.00
Carex hystericina	Porcupine sedge	4.00
Carex lupulina	Common hop sedge	4.00
Carex vulpinoidea	Fox sedge	6.00
Chelone glabra	Turtlehead	1.25
Elymus canadensis	Canada wild rye	6.00
Elymus virginicus	Virginia wild rye	12.00
Glyceria striata	Fowl manna grass	4.00
Helenium autumnale	Sneezeweed	1.50
Leersia oryzoides	Rice cut grass	2.00
Lobelia silphilitica	Great blue lobelia	1.50
Mimulus ringens	Monkeyflower	1.75
Panicum virgatum	Switch grass	2.50
Rudbeckia laciniata	Wild golden glow	0.75
Scirpus atrovirens	Dark green rush	6.00
Spartina pectinata	Prairie cord grass	4.00
Verbesina alternifolia	Wingstem	1.00
TOTAL NATIVE FORBS AND GRASSES		70.50 = (4.41 lbs/acre)

Temporary Cover Component

Scientific Name	Common Name	Ounces/Acre
Agrostis gigantea	Redtop	16.00
Elymus hystrix	Eastern bottlebrush grass	64.00
Lolium multiflorum	Annual rye	400.00
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

Scientific Name	Common Name	Quantity
Acer saccharinum	Silver maple	25
Betula nigra	River birch	25
Fraxinus pennsylvanica	Green ash	50
Quercus palustris	Pin oak	25
TOTAL TREES		125

DRAINAGE CHANNEL SIDESLOPE IMPACT AREA (0.03 acre)

Slope Stabilization Mix (36.00 pounds/acre)

Native Component

Scientific Name	Common Name	Ounces/Acre
Andropogon gerardii	Big bluestem	20.00
Bouteloua curtipendula	Side-oats grama	3.00
Elymus canadensis	Canada wild-rye	5.00
Panicum virgatum	Switch grass	12.00
Schizachyrium scoparium	Little bluestem	32.00
Sorghastrum nutans	Indian grass	24.00
TOTAL NATIVE GRASSES		96.00 = (6.00 lbs/acre)

Temporary Cover Component

Scientific Name	Common Name	Ounces/Acre
Agrostis gigantea	Redtop	16.00
Elymus hystrix	Eastern bottlebrush grass	64.00
Lolium perenne	Annual rye	400.00
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

Scientific Name	Common Name	Quantity
Cornus amomum	Silky dogwood	50
Salix discolor	Pussy willow	50
TOTAL TREES		100

TRANSITION ZONE IMPACT AREA (0.18 acre)

Slope Stabilization Mix (36.00 pounds/acre)

Native Component

Scientific Name	Common Name	Ounces/Acre
Andropogon gerardii	Big bluestem	20.00
Bouteloua curtipendula	Side-oats grama	3.00
Elymus canadensis	Canada wild-rye	5.00
Panicum virgatum	Switch grass	12.00
Schizachyrium scoparium	Little bluestem	32.00
Sorghastrum nutans	Indian grass	24.00
TOTAL NATIVE GRASSES		96.00 = (6.00 lbs/acre)

Temporary Cover Component

Scientific Name	Common Name	Ounces/Acre
Agrostis gigantea	Redtop	16.00
Elymus hystrix	Eastern bottlebrush grass	64.00
Lolium perenne	Annual rye	400.00
TOTAL		480.00 = (30.00 lbs/acre)

Native Trees and Shrubs

Scientific Name	Common Name	Quantity
Acer saccharum	Sugar maple	25
Juglans nigra	Black walnut	25
Liriodendron tulipifera	Tulip tree	50
Quercus rubra	Red oak	50
TOTAL TREES		150

2008 Supplemental Plantings

Native Trees and Shrubs

Scientific Name	Common Name	Quantity
Acer rubrum	Red maple	25
Acer saccharinum	Silver maple	25
Betula nigra	River birch	25
Cornus amomum	Silky dogwood	25
Cornus sericea	Red-osier dogwood	50
Liriodendron tulipifera	Tulip tree	25
Quercus palustris	Pin oak	25
Quercus rubra	Red oak	25
Salix nigra	Black willow	25
Ulmus americana	American oak	25
TOTAL TREES/SHRUBS		275

Appendix B:
Wetland Data Sheets

DATA ENTRY FORM

MITIGATION WETLAND MONITORING

Special Site Notes: None

Project Number: 040229

Project Name/Location: RMT/New Jersey

General Site Conditions: Moist soil surface

Date: August 28, 2008

Past and Present Weather: Sunny, dry

Hydrology: Dry to moist

Wildlife:

VEGETATION SAMPLING DATA

Transect 1: Transition Zone

Plot Number	Species Names	Cover	Plot Number	Species Names	Cover
Plot 1	*Acalypha rhomboidea*	1%	Plot 3	*Ambrosia artemisiifolia*	3%
	Agrostis gigantea	20%		*Andropogon gerardii*	4%
	Artemisia vulgaris	5%		*Andropogon scoparius*	2%
	Bidens frondosus	1%		*Artemisia vulgaris*	7%
	Coronilla varia	35%		*Bouteloua curtipendula*	3%
	Erigeron strigosus	1%		*Chrysanthemum leucanthemum*	2%
	Eupatorium rugosum	1%		*Cichorium intybus*	2%
	Euthamia graminifolia	40%		*Conyza canadensis*	1%
	Oxalis stricta	2%		*Dactyloctenium aegyptium*	40%
	Solidago altissima	5%		*Echinochloa crusgalli*	1%
				Erigeron strigosus	1%
Plot 2	*Acalypha rhomboidea*	1%		*Lespedeza hirta*	2%
	Andropogon gerardii	4%		*Lotus corniculata*	3%
	Artemisia vulgaris	4%		*Medicago lupulina*	1%
	Aster ericoides	3%		*Melilotus officinalis*	12%
	Chrysanthemum leuchanthemum	1%		*Panicum capillare*	1%
	Conyza canadensis	3%		*Plantago major*	10%
	Dactyloctenium aegyptium	10%		*Setaria glauca*	1%
	Echinochloa crusgalli	3%		*Solidago rugosa*	2%
	Erechtites hieracifolia	1%		*Trifolium repens*	3%
	Erigeron strigosus	1%		*Verbena hastata*	1%
	Euphorbia glyptosperma	2%			
	Euthamia graminifolia	5%	Plot 4	*Ambrosia artemisiifolia*	2%
	Melilotus alba	5%		*Artemisia vulgaris*	7%
	Panicum capillare	7%		*Chrysanthemum leucanthemum*	1%
	Panicum dichotomiflorum	20%		*Conyza canadensis*	1%
	Plantago major	4%		*Dactyloctenium aegyptium*	20%
	Polygonum pensylvanicum	1%		*Echinochloa crusgalli*	3%
	Potentilla simplex	1%		*Euphorbia glyptosperma*	2%
	Setaria glauca	1%		*Euthamia graminifolia*	50%
	Solidago altissima	3%		*Juncus tenuis*	1%
	Trifolium repens	7%		*Lythrum salicaria*	1%
	Verbena hastata	2%		*Panicum dichotomiflorum*	10%
				Plantago major	3%
				Populus deltoides	1%
				Potentilla simplex	1%
				Solidago altissima	15%
				Verbena urticifolia	1%

VEGETATION SAMPLING DATA					
Transect 1: Transition Zone					
Plot Number	**Species Names**	**Cover**	**Plot Number**	**Species Names**	**Cover**
Plot 5	*Acalypha rhomboidea*	1%			
	Agrostis gigantea	40%			
	Ambrosia artemisiifolia	1%			
	Andropogon gerardii	3%			
	Artemisia vulgaris	3%			
	Bidens frondosus	2%			
	Conyza canadensis	1%			
	Echinochloa crusgalli	2%			
	Euphorbia glyptosperma	1%			
	Euthamia graminifolia	7%			
	Juncus tenuis	1%			
	Lythrum salicaria	3%			
	Medicago lupulina	1%			
	Melilotus officinalis	4%			
	Panicum dichotomiflorum	7%			
	Populus deltoides	1%			
	Potentilla simplex	1%			
	Solidago altissima	10%			
	Sorghastrum nutans	20%			
	Trifolium repens	5%			

VEGETATION SAMPLING DATA		
Transition Zone Inventory		
Acalypha rhomboidea		*Lespedeza capitata*
Acer saccharinum		*Lespedeza hirta*
Agrostis gigantea		*Lolium perenne*
Ambrosia artemisiifolia		*Lotus corniculata*
Andropogon gerardii		*Lythrum salicaria*
Andropogon scoparius		*Medicago lupulina*
Apocynum cannabinum		*Melilotus alba*
Artemisia vulgaris		*Melilotus officinalis*
Aster ericoides		*Nepeta cataria*
Avena sativa		*Oxalis stricta*
Bidens frondosus		*Panicum capillare*
Bouteloua curtipendula		*Panicum dichotomiflorum*
Cassia chamaecrista		*Panicum virgatum*
Celastrus orbiculata		*Penstemon digitalis*
Centaurea maculosa		*Phytolacca americana*
Chrysanthemum leucanthemum		*Plantago lanceolata*
Cichorium intybus		*Plantago major*
Cirsium vulgare		*Polygonum pensylvanicum*
Conyza canadensis		*Polygonum persicaria*
Coronilla varia		*Populus deltoides*
Dactyloctenium aegyptium		*Potentiall norvegica*
Datura stramonium		*Potentilla simplex*
Daucus carota		*Rubus allegheniensis*
Desmodium ciliare		*Salix exigua*
Echinocloa crusgalli		*Setaria faberi*
Elaeagnus umbellata		*Setaria glauca*
Elymus virginicus		*Solidago altissima*
Eragrostis cilianensis		*Solidago rugosa*
Erigeron strigosus		*Sorghastrum nutans*
Eupatorium rugosum		*Trifolium repens*
Euphorbia glyptosperma		*Verbascum thapsus*
Euthamia graminifolia		*Verbena hastata*
Juncus effusus		*Verbena urticifolia*
Juncus tenuis		*Vitis labrusca*
Lamium purpureum		

VEGETATION SAMPLING DATA					
Transect 2: Emergent Wetland Zone					
Plot Number	**Species Names**	**Cover**	**Plot Number**	**Species Names**	**Cover**
Plot 1	*Agrostis hyemalis*	15%	Plot 3 (cont.)	*Juncus effusus*	4%
	Arisaema triphyllum	2%		*Leersia oryzoides*	2%
	Cirsium arvense	2%		*Liatris scariosa*	3%
	Epilobium coloratum	15%		*Lobelia cardinalis*	3%
	Euthamia graminifolia	7%		*Lythrum salicaria*	2%
	Impatiens capensis	1%		*Panicum capillare*	3%
	Leersia oryzoides	2%		*Penthorum sedoides*	2%
	Lythrum salicaria	2%		*Phalaris arundinacea*	5%
	Parthenocissus quinquefolia	2%		*Pilea pumila*	5%
	Phalaris arundinacea	8%		*Plantago major*	2%
	Pilea pumila	3%		*Polygonum pensylvanicum*	1%
	Polygonum punctatum	10%		*Polygonum persicaria*	2%
	Polygonum sagittatum	20%		*Polygonum punctatum*	1%
	Solidago gigantea	5%		*Setaria faberi*	1%
	Toxicodendron radicans	10%		*Solidago altissima*	2%
	Typha latifolia	3%		*Trifolium repens*	5%
Plot 2			Plot 4	*Acalypha rhomboidea*	4%
	Agrosts hyemalis	30%		*Acer saccharinum*	1%
	Cirsium arvense	7%		*Agrostis gigantea*	15%
	Cornus amomum	2%		*Aster lanceolatus*	2%
	Euthamia graminifolia	25%		*Coronilla varia*	3%
	Phalaris arundinacea	3%		*Daucus carota*	3%
	Pilea pumila	1%		*Epilobium coloratum*	1%
	Polygonum punctatum	1%		*Euthamia graminifolia*	15%
	Polygonum sagittatum	5%		*Glechoma hederacea*	1%
	Solidago gigantea	1%		*Juncus effusus*	8%
	Toxicodendron radicans	5%		*Lobelia siphilitica*	7%
				Lotus corniculata	5%
Plot 3	*Acalypha rhomboidea*	20%		*Lythrum salicaria*	5%
	Agrostis hyemalis	10%		*Oxalis stricta*	1%
	Artemisia vulgaris	1%		*Pilea pumila*	1%
	Chrysanthemum leucanthemum	3%		*Plantago major*	7%
	Cyperus strigosus	2%		*Poa compressa*	2%
	Echinochloa crusgalli	10%		*Polygonum persicaria*	1%
	Epilobium coloratum	3%		*Solidago altissima*	20%
	Erechtites hieracifolia	2%			
	Euthamia graminifolia	7%			

VEGETATION SAMPLING DATA					
Transect 2: Emergent Wetland Zone					
Plot Number	**Species Names**	**Cover**	**Plot Number**	**Species Names**	**Cover**
Plot 5	*Agrostis gigantea*	15%			
	Aster ericoides	5%			
	Daucus carota	6%			
	Euthamia graminifolia	7%			
	Glechoma hederacea	1%			
	Juncus effusus	10%			
	Lobelia siphilitica	3%			
	Lythrum salicaria	15%			
	Oxalis stricta	1%			
	Plantago major	12%			
	Solidago altissima	30%			
	Solidago gigantea	2%			
Plot 6	*Agrostis gigantea*	75%			
	Daucus carota	3%			
	Euthamia graminifolia	5%			
	Lotus corniculata	2%			
	Lythrum salicaria	5%			
	Plantago major	3%			
	Solidago altissima	5%			

VEGETATION SAMPLING DATA		
Emergent Wetland Zone Inventory		
Hydrology: Soil moist at surface.		
Species Names		**Species Names**
Acalypha rhomboidea		*Lobelia cardinalis*
Acer saccharinum		*Lobelia siphilitica*
Agrostis gigantea		*Lotus corniculata*
Agrostis hyemalis		*Lythrum salicaria*
Arisaema triphyllum		*Mimulus ringens*
Artemisia vulgaris		*Oxalis stricta*
Aster ericoides		*Panicum capillare*
Aster simplex		*Parthenocissus quinquefolia*
Carex crinita		*Penthorum sedoides*
Chrysanthemum leucanthemum		*Phalaris arundinacea*
Cirsium arvense		*Pilea pumila*
Cornus amomum		*Plantago major*
Coronilla varia		*Poa compressa*
Cyperus strigosus		*Polygonum persicaria*
Daucus carota		*Polygonum punctatum*
Dioscorea villosa		*Polygonum sagittatum*
Echinochloa crusgalli		*Setaria faberi*
Epilobium coloratum		*Solidago altissima*
Erechtites hieracifolia		*Solidago gigantea*
Euthamia graminifolia		*Toxicodendron radicans*
Glechoma hederacea		*Trifolium repens*
Impatiens capensis		*Typha latifolia*
Juncus effusus		*Urtica diocia*
Leersia oryzoides		
Liatris scariosa		

VEGETATION SAMPLING DATA					
Transect 3: Forested Wetland Zone					
Plot Number	**Species Names**	**Cover**	**Plot Number**	**Species Names**	**Cover**
Plot 1	*Agrostis hyemalis*	10%	Plot 3	*Acalypha rhomboidea*	10%
	Cyperus strigosus	5%		*Agrostis hyemalis*	50%
	Echinochloa crusgalli	20%		*Artemisia vulgaris*	1%
	Eleocharis obtusa	5%		*Conyza canadensis*	1%
	Epilobium coloratum	3%		*Daucus carota*	2%
	Erechtites hieracifolia	2%		*Echinochloa crusgalli*	1%
	Leersia oryzoides	35%		*Elaeagnus umbellata*	2%
	Lythrum salicaria	5%		*Dactyloctenium aegyptium*	5%
	Oxypolis rigidior	3%		*Erechtites hieracifolia*	2%
	Typha latifolia	20%		*Euthamia graminifolia*	15%
				Helenium autumnale	6%
				Juncus tenuis	1%
Plot 2	*Acalypha rhomboidea*	1%		*Lamium purpureum*	2%
	Acer saccharinum	1%		*Lolium perenne*	2%
	Agrostis hyemalis	7%		*Medicago lupulina*	1%
	Ambrosia artemisiifolia	2%		*Panicum dichotomiflorum*	3%
	Bidens cernuus	3%		*Plantago lanceolata*	4%
	Cyperus strigosus	5%		*Plantago major*	15%
	Echinochloa crusgalli	20%		*Potentilla simplex*	1%
	Euthamia graminifolia	8%		*Rosa palustris*	1%
	Helenium autumnale	7%		*Setaria glauca*	1%
	Lolium perenne	5%		*Solidago altissima*	7%
	Ludwigia palustris	1%		*Trifolium repens*	6%
	Lythrum salicaria	10%			
	Oxalis stricta	5%			
	Panicum dichotomiflorum	2%	Plot 4	*Acalypha rhomboidea*	10%
	Penthorum sedoides	2%		*Agrostis hyemalis*	30%
	Plantago lanceolata	10%		*Artemisia vulgaris*	5%
	Polygonum pensylvanicum	1%		*Bidens frondosa*	1%
	Polygonum persicaria	3%		*Conyza canadensis*	2%
	Populus deltoides	3%		*Coronilla varia*	5%
	Setaria faberi	1%		*Echinochloa crusgalli*	15%
	Solidago altissima	4%		*Erechtites hieracifolia*	5%

VEGETATION SAMPLING DATA					
Transect 3: Forested Wetland Zone					
Plot Number	**Species Names**	**Cover**	**Plot Number**	**Species Names**	**Cover**
Plot 4 (cont.)	*Euphorbia glyptosperma*	3%	Plot 6	*Agrostis hyemalis*	65%
	Euthamia graminifolia	3%		*Coronilla varia*	2%
	Helenium autumnale	7%		*Euthamia graminifolia*	25%
	Medicago lupulina	2%		*Lobelia siphilitica*	1%
	Oxalis stricta	7%		*Polygonum punctatum*	1%
	Panicum capillare	7%		*Rosa multiflora*	2%
	Panicum dichotomiflorum	2%		*Setaria faberi*	3%
	Potentilla simplex	3%		*Solidago altissima*	7%
	Setaria glauca	5%		*Solidago rugosa*	5%
	Solidago altissima	3%			
Plot 5	*Agrostis hyemalis*	30%			
	Carex vulpinoidea	2%			
	Daucus carota	3%			
	Euthamia graminifolia	5%			
	Fraxinus pennsylvanica	2%			
	Geum canadense	1%			
	Geum laciniatum	5%			
	Juncus tenuis	1%			
	Leersia oryzoides	1%			
	Potentilla simplex	3%			
	Solidago altissima	50%			
	Toxicodendron radicans	2%			
	Verbena urticifolia	3%			

VEGETATION SAMPLING DATA		
Forested Wetland Zone Inventory		
Hydrology: Soil moist to saturated at surface.		
Species Names		**Species Names**
Acalypha rhomboidea		*Lolium perenne*
Acer saccharinum		*Ludwigia palustris*
Agrostis gigantea		*Medicago lupulina*
Agrostis hyemalis		*Melilotus officinalis*
Ambrosia artemisiifolia		*Mentha spicata*
Artemisia vulgaris		*Mimulus ringens*
Bidens cernuus		*Oxalis stricta*
Bidens frondosus		*Oxypolis rigidior*
Carex hystericina		*Panicum capillare*
Carex lurida		*Panicum dichotomiflorum*
Carex vulpinoidea		*Penthorum sedoides*
Chrysanthemum leucanthemum		*Phalaris arundinacea*
Conyza canadensis		*Pilea pumila*
Coronilla varia		*Plantago lanceolata*
Cyperus strigosus		*Plantago major*
Dactyloctenium aegyptium		*Polygonum pensylvanicum*
Daucus carota		*Polygonum persicaria*
Echinochloa crusgalli		*Polygonum punctatum*
Elaeagnus umbellata		*Polygonum virginianum*
Eleocharis obtusa		*Populus deltoides*
Epilobium coloratum		*Potentilla simplex*
Erechtites hieracifolia		*Quercus palustris*
Erigeron strigosus		*Rosa multiflora*
Euphorbia glyptosperma		*Rosa palustris*
Euthamia graminifolia		*Scirpus atrovirens*
Fraxinus pennsylvanica		*Setaria faberi*
Geum canadense		*Setaria glauca*
Geum laciniatum		*Solidago altissima*
Helenium autumnale		*Solidago gigantea*
Impatiens capensis		*Solidago rugosa*
Juncus tenuis		*Toxicodendron radicans*
Lamium purpureum		*Trifolium repens*
Leersia oryzoides		*Typha latifolia*
Lobelia cardinalis		*Ulmus americana*
Lobelia siphilitica		*Verbena urticifolia*

Appendix C:
Photographs of
Wetland Development

Photo 1. View facing southeast from Photostation 3 (May 29, 2008).

Photo 2. View facing east of mitigation area (May 29, 2008).

Site Photographs
May 29 and September 4, 2008
L.E. Carpenter & Company
Wetland Restoration Area
Wharton, Morris County, New Jersey

JFNew # 040229

JFNew
11181 Marwill Avenue West Olive, MI 49460
Phone 616-847-1680 / Fax 616-847-9970
www.jfnew.com

Photo 3. View facing south in mitigation area (September 4, 2008).

Photo 4. Close-up view of vegetation along fence on north side of mitigation area (September 4, 2008).

Site Photographs
May 29 and September 4, 2008
L.E. Carpenter & Company
Wetland Restoration Area
Wharton, Morris County, New Jersey

JFNew # 040229

JFNew
11181 Marwill Avenue West Olive, MI 49460
Phone 616-847-1680 / Fax 616-847-9970
www.jfnew.com

Photo 5. View facing east towards isolated transition zone. (May 29, 2008)

Photo 6. View facing east towards isolated transition zone. (September 4, 2008)

Site Photographs
May 29 and September 4, 2008
L.E. Carpenter & Company
Wetland Restoration Area
Wharton, Morris County, New Jersey

JFNew # 040229

JFNew
11181 Marwill Avenue West Olive, MI 49460
Phone 616-847-1680 / Fax 616-847-9970
www.jfnew.com

Photo 7. View facing south of low depressional area in emergent/forested wetland zone. (May 29, 2008)

Photo 8. View facing southwest of low depressional area. (September 4, 2008)

Site Photographs **May 29 and September 4, 2008** **L.E. Carpenter & Company** **Wetland Restoration Area** **Wharton, Morris County, New Jersey**	JFNew # 040229	JFNew 11181 Marwill Avenue West Olive, MI 49460 Phone 616-847-1680 / Fax 616-847-9970 www.jfnew.com

Photo 9. Deer tracks in mud (May 29, 2008).

Photo 10. Deer bed in wetland vegetation (September 4, 2008).

JFNew

11181 Marwill Avenue West Olive, MI 49460
Phone 616-847-1680 / Fax 616-847-9970
www.jfnew.com

Appendix D:
NJDEP Permit 1439-04-0001.1

State of New Jersey
Department of Environmental Protection

Richard J. Codey
Acting Governor

Bradley M. Campbell
Commissioner

Land Use Regulation Program
P.O. Box 439, Trenton, NJ 08625-0439
Fax # (609) 292-8115
www.state.nj.us/dep/landuse

FEB 25 2005

Mr. Nicholas Clevett
RMT, Inc., Michigan
2025 E. Beltline Avenue SE, Suite 402
Grand Rapids, MI 49546

RE: Authorization for Freshwater Wetlands Statewide General Permit No. 4
File No.: 1439-04-0001.1 (FWW 040001)
Applicant: L.E. Carpenter & Company
Block: 301; Lot: 1
Block: 801; Lots: 3, 4, & 5
Wharton Borough, Morris County
Nearest Waterway: Rockaway River
Passaic River Basin

Dear Mr. Clevett:

The Land Use Regulation Program has reviewed the referenced application for a Statewide General Permit authorization pursuant to the requirements of the Freshwater Wetlands Protection Act Rules at N.J.A.C. 7:7A. **The proposed activity is authorized by Statewide General Permit No. 4**, which allows regulated activities in freshwater wetlands, transition areas and State open waters for the investigation, cleanup or removal of hazardous substances or pollutants, which are undertaken, authorized or otherwise expressly approved in writing by the Department of Environmental Protection (Department).

Limit of Authorized Disturbance

The approved plans are prepared by RMT, Inc., dated February 21, 2005, last revised February 21, 2005, and entitled:

"L.E. Carpenter, Wetland and Stream Encroachment Permit Applications, Wharton, New Jersey"

"F3 – Wetland Impact Map", Sheet No. F3 of 7;
"F4 – Wetland Restoration Plan", Sheet No. F4 of 7;
"F5 – Construction Staging and Excavation Plan", Sheet No. F5 of 7;
"F6 – Final Grading Plan", Sheet No. F6 of 7;
"F7 – Details", Sheet No. F7 of 7

Based on the approved plans, the authorized activity involves the disturbance of approximately 0.42 of an acre of freshwater wetlands and/or State open waters and approximately 0.19 acres of wetland transition areas for removal of contaminated soil and restoration of the disturbed areas. Any additional disturbance of freshwater wetlands, State open waters or transition areas besides that shown on the approved plans shall be considered a violation of the Freshwater Wetlands Protection Act unless the activity is exempt or a permit is obtained prior to the start of the disturbance from the Land Use Regulation Program.

Permit Conditions

The activities allowed by this authorization shall comply with the following conditions. Failure to comply with these conditions shall constitute a violation of the Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq.).

Special Conditions

1. All regulated activities at this existing Superfund site must be in accordance with the requirements of the Department's Site Remediation Program and the United States Environmental Protection Agency, including any requirements contained within an approved Remedial Action Workplan.

2. In order to protect the trout maintenance and trout stocked waters of the Rockaway River, any proposed grading or construction activities within the banks of this river are prohibited between March 15 and June 15 of each year. In addition, any activity within the 100-year flood plain or flood hazard area of this watercourse which could introduce sediment into said stream or which could cause an increase in the natural level of turbidity is also prohibited during this period. The Department reserves the right to suspend all regulated activities on site should it be determined that the applicant has not taken proper precautions to ensure continuous compliance with this condition.

3. All backfill soils shall consist of clean, suitable material free from toxic pollutants in toxic amounts.

4. In addition to restoration of the wetland transition area as shown on the approved plan entitled "F4- Wetland Restoration Plan", the applicant shall also restore an area of wetland transition area not currently shown on the plan. This area extends 50' from the wetlands on the Wharton Enterprise property. These wetlands are classified as Intermediate resource value. This additional wetland transition area is drawn on the attached map portion. The restoration of this additional area shall be consistent with the notes on Sheet No. F4 of 7.

5. The mitigation project must be conducted prior to or concurrent with the construction of the approved project.

6. Mitigate for the loss of 0.16 acres of emergent wetlands and 0.26 acres of forested and scrub/shrub wetlands through an on-site restoration project as shown on the plan entitled "F4 - Wetland Restoration Plan, L.E. Carpenter, Wetland and Stream Encroachment Permit Applications, Wharton, New Jersey", dated February 21, 2005, last revised February 21, 2005, and prepared by RMT, Inc. In the event there is a conflict between the permit conditions and the approved mitigation plan and proposal the permit conditions take precedent.

7. The permittee shall notify the Land Use Regulation Program, in writing, at least thirty (30) days in advance of the start of construction of the wetland mitigation project for an on-site pre-construction meeting between the permittee, the contractor, the consultant and the Program.

8. The mitigation designer must be present during critical stages of construction of the mitigation project this includes but is not limited to herbicide applications, sub-grade inspection, final grade inspection, and planting inspection to ensure the intent of the mitigation design and their predicted wetland hydrology is realized in the landscape. Mitigation designs are not static documents and changes may be necessary to ensure success of the project. It shall be the prerogative of the mitigation consultant to make changes to the design should field conditions warrant such action.

9. Immediately following final grading of the site, a disc must be run over the site to eliminate compaction. The mitigation designer must be present to oversee this phase of the project and confirm with the Department this activity has occurred prior to planting of the site.

10. Immediately following the final grading of the mitigation site and prior to planting, the permittee shall notify the Program for a post-grading construction meeting between the permittee, contractor, consultant and the Program. The permittee must give the Program at least thirty (30) days notice prior to the date of this meeting.

11. Within 30 days following the final grading and planting of the mitigation project, the permittee shall submit a final report to the Land Use Regulation Program. The final report shall contain, at a minimum, the following information:

    a. A completed WETLAND MITIGATION PROJECT COMPLETION OF CONSTRUCTION FORM (attached) which certifies that the mitigation project has been constructed as designed and that the proposed area of wetland creation, restoration or enhancement has been accomplished;

    b. As built plans which depict final grade elevations at one foot contours and include a table of the species and quantities of vegetation that were planted including any grasses that may have been used for soil stabilization purposes;

    c. Show on the as-built plans that the boundaries of the wetland mitigation area has been visibly marked with 3 inch white PVC pipe extending 4 feet above the ground surface. The stakes must remain on the site for the entire monitoring period;

d. Photos of the constructed wetland mitigation project with a photo location map as well as the GPS waypoints in NJ state plane coordinates NAD 1983;

e. To document that the required amount of soil has been placed/replaced over the entire area of the mitigation site, provide a minimum of 6 soil profile descriptions to a depth of 20 inches. The location of each soil profile description should be depicted on the as built plan as well as provide the GPS waypoints in NJ state plane coordinates NAD 1983;

f. Submit soil test results demonstrating at least 8% organic carbon content (by weight) was incorporated into the A-horizon for sandy soil and for all other soil types 12% organic content or if manmade top soil was used it consisted of equal volumes of organic and mineral materials;

g. The permittee shall post the mitigation area with several permanent signs, which identify the site as a wetland mitigation project and that mowing, cutting, dumping and draining of the property is prohibited; and

h. The sign must also state the name of the permittee, LURP permit number along with a contact name and phone number.

12. If the Program determines that the mitigation project is not constructed in conformance with the approved plan, the permittee will be notified in writing and will have 60 days to submit a proposal to indicate how the project will be corrected. No financial surety will be released by the Program until the permittee demonstrates that the mitigation project is constructed in conformance with the approved plan, all soil has been stabilized and there is no active erosion.

13. The permittee shall monitor the mitigation project for 5 full growing seasons if it is a proposed forested or scrub/shrub wetland and 3 full growing seasons for an emergent wetland or State open water after the mitigation project has been constructed. The permittee shall submit monitoring reports to the Land Use Regulation Program no later than December 31st of each monitoring year (All monitoring reports must include the standard items identified in the attachment and the information requested below).

14. All monitoring report will include all the following information (see attached monitoring report checklist):

a. All monitoring reports except the final one must include documentation that it is anticipated, based on field data, that the goals of the wetland mitigation project including the transition area, as stated in the approved wetland mitigation proposal and the permit will be satisfied. If the permittee is finding problems with the mitigation project and does not anticipate the site will be a full success then recommendations on how to rectify the problems must be included in the report with a time frame in which they will be completed;

b. All monitoring reports except the final one must include field data to document that the site is progressing towards 85 percent survival and 85 percent area coverage of mitigation plantings or target hydrophytes (Target hydrophytes are non-invasive native species to the area and similar to ones identified on the mitigation planting plan). If the proposed plant community is a scrub/shrub or a forested wetland the permittee must also demonstrate each year with data that the woody species are thriving, increasing in stem density and height each year. If the field data shows that the mitigation project is failing to meet the vegetation survival, coverage and health goals, the monitoring

report should contain a discussion of steps that will be taken to rectify the problem, including a schedule of implementation;

c. All monitoring reports except the final one must include documentation of any invasive or noxious species (see below for list of species) colonizing the site and how they are being eliminated. The permittee is required to eliminate either through hand-pulling, application of a pesticide or other Department approved method any occurrence of an invasive/noxious species on the mitigation site during the monitoring period;

d. All monitoring reports except the final one must include documentation that demonstrates the proposed hydrologic regime as specified in the mitigation proposal appears to be met. If the permittee is finding problems with the mitigation project and does not anticipate the proposed hydrologic regime will be or has not been met then recommendations on how to rectify the problem must be included in the report along with a time frame within which it will be completed;

e. The final monitoring report must include documentation to demonstrate that the goals of the wetland mitigation project including the required transition area, as stated in the approved wetland mitigation proposal and the permit, has been satisfied. Documentation for this report will also include a field wetland delineation of the wetland mitigation project based on techniques as specified in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989);

f. The final monitoring report must include documentation the site has an 85 percent survival and 85 percent area coverage of the mitigation plantings or target hydrophytes. The permittee must also document that all plant species are healthy and thriving and if the proposed plant community contains trees demonstrate that the trees are at least five feet in height;

g. The final monitoring report must include documentation demonstrating the site is less than 10 percent occupied by invasive or noxious species such as but not limited to *Phalaris arundinacea* (Reed canary grass), *Phragmities australis* (Common reed grass), *Pueraria lobata* (Kudzu), *Typha latifloia* (Broad-leaved cattail), *Typha angustifolia* (Narrowed leaved cattail), *Lythrum salicaria* (Purple loosestrife), *Ailanthus altissima* (Tree-of-heaven), *Berberis thunbergi* (Japanese barberry), *Berberis vulgaris* (Common barberry), *Elaeagnus angustifloia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (Common privet) and *Rosa multiforia* (Multiflora rose);

h. The final monitoring report must include documentation that demonstrates that the proposed hydrologic regime as specified in the mitigation proposal, which proves the mitigation site is a wetland has been satisfied. The documentation shall include when appropriate monitoring well data, stream gauge data, photographs and field observation notes collected throughout the monitoring period; and

i. The final monitoring report must include documentation that the site contains hydric soils or there is evidence of reduction occurring in the soil throughout the delineated wetlands.

15. Once the required monitoring period has expired and the permittee has submitted the final monitoring report, the Program will make the finding that the mitigation project is either a

success or a failure. This mitigation project will be considered successful if the permittee demonstrates all of the following:

a. That the goals of the wetland mitigation project including acreage and the required transition area, as stated in the approved wetland mitigation proposal and the permit, has been satisfied. The permittee must submit a field wetland delineation of the wetland mitigation project based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989) which shows the exact acreage of State open waters, emergent, scrub/shrub and/or forested wetlands in the mitigation area;

b. The site has an 85 percent survival and 85 percent area coverage of the mitigation plantings or target hydrophytes which are species native to the area and similar to ones identified on the mitigation planting plan. All plant species in the mitigation area are healthy and thriving. All trees are at least five feet in height;

c. The site is less than 10 percent occupied by invasive or noxious species such as but not limited to *Phalaris arundinacea* (Reed canary grass), *Phragmities australis* (Common reed grass), *Pueraria montana* (Kudzu), *Typha latifloia* (Broad-leaved cattail), *Typha angustifolia* (Narrowed leaved cattail), *Lythrum salicaria* (Purple loosestrife), *Ailanthus altissima* (Tree-of-heaven), *Berberis thunbergi* (Japanese barberry), *Berberis vulgaris* (Common barberry), *Elaeagnus angustifloia* (Russian olive), *Elaeagnus umbellata* (Autumn olive), *Ligustrum obtusifolium* (Japanese privet), *Ligustrum vulgare* (Common privet) and *Rosa multiforia* (Multiflora rose);

d. The site contains hydric soils or there is evidence of reduction occurring in the soil; and,

e. The proposed hydrologic regime as specified in the mitigation proposal, which proves the mitigation site is a wetland has been satisfied.

16. If the mitigation project is considered a failure, the permittee is required to submit a revised mitigation plan to rectify the wetland mitigation site. The plan shall be submitted within 60 days of receipt of the letter from the Program indicating the wetland mitigation project was a failure.

17. The permittee shall assume all liability for accomplishing corrective work should the Program determine that the compensatory mitigation has not been 100% satisfactory. Remedial work may include re-grading and/or replanting the mitigation site. This responsibility is incumbent upon the permittee until such time that the Department makes the finding that the mitigation project is successful.

In addition to the above conditions and the conditions noted at N.J.A.C. 7:7A 4.3 and 5.4, the following general conditions must be met for the activity authorized under this Statewide General Permit:

General Conditions:

18. All fill and other earth work on the lands encompassed within this permit authorization shall be stabilized in accordance with "Standards for Soil Erosion and Sediment Control in New Jersey" to prevent eroded soil from entering adjacent waterways or wetlands at any time during and subsequent to construction.

19. This permit is revocable in accordance with DEP regulations and State law.

20. The issuance of this permit shall not be deemed to affect in any way other actions by the Department on any future application.

21. The activities shown on the approved plans shall be constructed and/or executed in conformity with any notes and details on said plans and any conditions stipulated herein.

22. No change in plans or specifications shall be made except with the prior written permission of the Department.

23. The granting of this authorization shall not be construed to in any way affect the title or ownership of the property, and shall not make the Department or the State a party in any suit or question of ownership of the property.

24. This permit is not valid and no work shall be undertaken pursuant to this authorization until all other required federal, state, and local approvals, licenses and permits necessary for commencement of work onsite have been obtained.

25. A complete, legible copy of this permit shall be kept at the work site and shall be exhibited upon request of any person.

26. The permittee shall allow the Program the right to inspect the construction site and also shall provide the Bureau of Coastal and Land Use Compliance and Enforcement, NJDEP, 401 East State Street, P.O. Box 422, Trenton, New Jersey 08625 with written notification 7 days prior to the start of the authorized work.

27. This authorization is valid for five years from the date of this letter unless more stringent standards are adopted by rule prior to this date.

Transition Area

The wetlands affected by this permit authorization are of Ordinary and Intermediate resource value. The wetland located associated with the drainage channel located along the eastern side of the site are classified as Ordinary resource value. No standard transition area is required adjacent to Ordinary resource value wetlands. The wetlands located on the adjacent Wharton Enterprise property are classified as Intermediate resource value and have a standard required transition area or buffer of 50 feet. In addition, all of the wetlands are classified as priority wetlands by the United States Environmental Protection Agency since they drain into the Passaic River Basin. This General Permit includes a transition area waiver that allows encroachment only in that portion of the transition area that has been determined by the Department to be necessary to accomplish the regulated activities. Any additional regulated activities conducted within the standard transition area shall require a separate transition area

waiver from the Program. Regulated activities within a transition area are defined at N.J.A.C. 7:7A-2.6.

Consistency with the Areawide Water Quality Management Plan

This project has not been reviewed for consistency with the relevant Water Quality Management Plan or Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15). As such, there is no intended or implied approval regarding additional permits which may be required from the Department. For treatment works approvals, the consistency determination will be performed by the Bureau of Engineering and Permitting (North/South) which may be contacted at (609) 292-6894 for North (Middlesex, Hunterdon and Counties north) or (609) 633-1139 for South (Mercer, Monmouth and Counties south). For general information concerning the water quality management planning process, please contact the Division of Watershed Management at (609) 633-1179.

Appeal of Decision

In accordance with N.J.A.C. 7:7A-1.7, any person who is aggrieved by this decision may request a hearing within 30 days of the decision date by writing to: New Jersey Department of Environmental Protection, Office of Legal Affairs, Attention: Adjudicatory Hearing Requests, P.O. Box 402, Trenton NJ 08625. This request must include a completed copy of the Administrative Hearing Request Checklist.

If you have any questions regarding this authorization, please contact Susan Michniewski of our staff at (609) 633-9277. Please reference the above file number.

Sincerely,

Mark A. Godfrey, Supervisor
Morris & Bergen Counties Region
Bureau of Inland Regulation

Attachments (map sketch, mitigation forms)

c. Anthony Cinque, Site Remediation Program
Jodale Legg, Land Use Regulation Program – Mitigation Unit
Nadine White, Land Use Regulation Program
Bureau of Coastal and Land Use Compliance and Enforcement
Wharton Borough Clerk
Wharton Borough Construction Official
Wharton Borough Planning Board
Wharton Borough Environmental Commission